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DERWENT-WEEK: 200105

TITLE: Plastic component with e.g. GRP-bonded metal inlay, varies composition, density and orientation of fibers for optimal stress transmission, strength and durability, overcoming differential thermal expansion and resilience mismatch

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ABSTRACTED-PUB-NO: EP 1048442A
BASIC-ABSTRACT: NOVELTY - Plastic component with e.g. GRP-bonded metal inlay,
varies composition, density and orientation of fibers.

DETAILED DESCRIPTION - Any combination of the following structures may be included. The inlay (13) is bonded to the plastic body (11) by a plastic layer (12), in which state the bonding layer smoothly transforms the modulus of elasticity determining stiffness, and/or the coefficient of thermal expansion,

between body and inlay. The bonding section may contain one or more holes through which reinforcing fibers, fibrous strands and/or textile sheet are looped. These are embedded in the plastic matrix of the component, to which they are intimately bonded. The bonding section has comb-shaped, parallel or fanned-out strips; or else molded-on fingers.

An INDEPENDENT CLAIM covers the method and variant methods of making corresponding component forms. In one version, the inlay is metal which is first surface-treated for adhesion. A coupling layer of fiber-reinforced plastic is added. The result is placed in a pressing- or injection mold with the plastic body. The plastic body is deformed in an injection- or pressing process, resulting in an interlocking bond.

USE - To make a composite component, in which an inlay is bonded, preferably using fiber-reinforced plastic, where the fibers, their composition, proportions and orientations are selected and controlled for optimum stress transfer between the body of component and inlay. Interfacial bonding and keying are also optimized. Applications include: trams and other rail vehicles, aircraft, machines and building structures (all foregoing applications are claimed).

ADVANTAGE - The component is produced economically with a bonding which has high mechanical strength, load bearing capability and lasting adhesion, despite differing elasticity, stiffness and coefficients of thermal expansion between body and inlay, noting that the inlay is a metal, especially aluminum. Large numbers of possible materials are specified in the disclosure, hence the principles may be considered widely-applicable. The process and examples are further discussed and illustrated by cross sections in the disclosure.

DESCRIPTION OF DRAWING(S) - The cross section is one of a number of possible variants illustrated in the disclosure.

plastic body 11

reinforced plastic layer 12

inlay 13

CHOSEN-DRAWING: Dwg.4/11

TITLE-TERMS:
PLASTIC COMPONENT GRP BOND METAL INLAY VARY COMPOSITION DENSITY ORIENT OPTIMUM

STRESS TRANSMISSION STRENGTH DURABLE OVERCOME DIFFERENTIAL THERMAL EXPAND
RESILIENT MISMATCH

DERWENT-CLASS: A32 A95 Q43 Q44

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